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## Patent Abstracts of Japan

PUBLICATION NUMBER : 56150878  
PUBLICATION DATE : 21-11-81

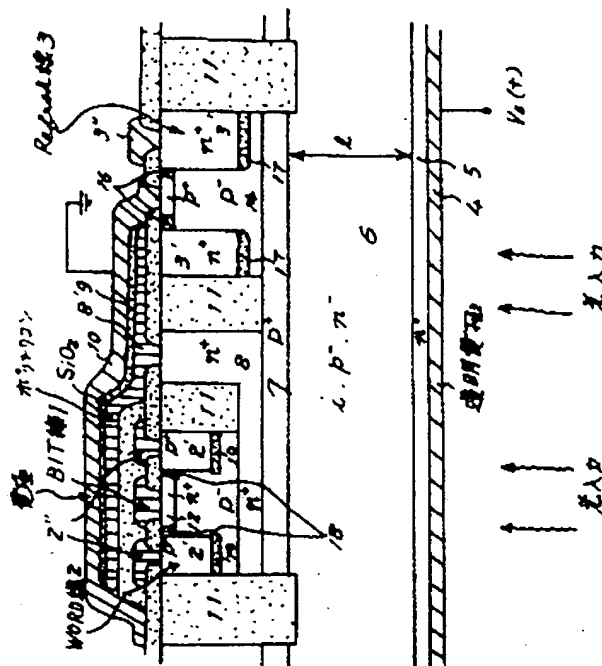
APPLICATION DATE : 22-04-80  
APPLICATION NUMBER : 55054001

APPLICANT : SEMICONDUCTOR RES FOUND;

INVENTOR : TAMAMUSHI NAOSHIGE;

INT.CL. : H01L 31/10 H04N 5/30

TITLE : SEMICONDUCTOR IMAGE PICKUP  
DEVICE



ABSTRACT : PURPOSE: To improve the sensitivity and the resolution of a semiconductor image pickup device as compared with both CCD and MOS image sensors by providing a plurality of cells of hook structure in which a high resistance region for substantially detecting a light and a high impurity density region having different conductivity type from the high resistance region are connected in a semiconductor substrate.

CONSTITUTION: A light input introduced through a transparent electrode 4 to which a predetermined bias voltage  $V_s(+)$  is applied generates electron and hole pairs in a high resistance layer 6 specially in the vicinity of an  $n^+$  type layer 5 of a hook structure. The layer 6 is completely depleted in the entire region by the applied voltage  $V_s$ , and an electric field to run the carrier at a saturated speed is applied to almost all the region. The generated electrons are attracted by the  $V_s(+)$  bias and absorbed by the layer 5, and the holes generated in pairs are stored in a  $p^+$  type region 7. This is because an  $i$  type region 6 is depleted by the bias voltage  $V_s(+)$  and a strong electric field is applied to the entire thickness  $l$  of the  $i$  type layer. When the holes are stored in an  $p^+$  type layer 7, the layer 7 is charged positively. Accordingly, electrons in an  $n^+$  type region 8 override the thin layer 7 and flow to the side of the substrate.

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